

What Is Claimed:

- 1 1. An electrical machine comprising:
2 a stator core having slots;
3 a set of windings disposed within said slots,
4 said set of windings having $2N+1$ phases where N is an
5 integer greater than 1.
- 1 2. An electrical machine as recited in claim 1
2 wherein said set of windings is coupled to a common node.
- 1 3. An electrical machine as recited in claim 1
2 wherein said set of windings is coupled polygonally.
- 1 4. An electrical machine as recited in claim 1
2 further comprising a switching circuit coupled to said set
3 of windings, said switching circuit comprising at least
4 $2(2N+1)$ switching elements.
- 1 5. An electrical machine as recited in claim 4
2 further comprising a full wave rectifier.
- 1 6. An electrical machine as recited in claim 1
2 wherein $N=2$.
- 1 7. An electrical machine as recited in claim 1
2 wherein $N=3$.
- 1 8. An electrical machine as recited in claim 1
2 wherein said electrical machine comprises a generator.
- 1 9. An electrical machine as recited in claim 1
2 wherein said set of windings has a full pitch.

1 10. An electrical machine as recited in claim 1
2 wherein said set of windings has a fractional pitch.

1 11. An alternator for an automotive vehicle
2 comprising:

3 a housing;
4 a rotor rotatably disposed within said housing;
5 a stator core disposed within said housing
6 adjacent to said rotor, said stator core having slots; and
7 a set of windings disposed within said slots,
8 said set of windings having $2N+1$ phases where N is an
9 integer greater than 1.

1 12. An alternator as recited in claim 11
2 further comprising a full wave rectifier.

1 13. An alternator as recited in claim 11
2 wherein said set of windings is coupled to a common node.

1 14. An alternator as recited in claim 11
2 wherein said set of windings is coupled schematically in a
3 polygon.

1 15. An alternator as recited in claim 14
2 wherein said polygon has $2N+1$ sides.

1 16. An alternator as recited in claim 11
2 further comprising a rectifier circuit coupled to said
3 first set of windings, said rectifier circuit comprising
4 at least $2(2N+1)$ rectifying elements.

1 17. An alternator as recited in claim 11
2 wherein $N=2$.

1 18. An alternator as recited in claim 11
2 wherein $N=3$.

1 19. An alternator for an automotive vehicle
2 comprising:

3 a housing;

4 a rotor rotatably disposed within said housing;

5 a stator core disposed within said housing
6 adjacent to said rotor, said stator core having slots;

7 a set of windings disposed within said slots,
8 said set of windings having $2N+1$ phases where N is an
9 integer greater than 1; and

10 a full wave rectifier circuit coupled to said
11 set of windings, said rectifier circuit comprising at
12 least $2(2N+1)$ rectifying elements.

1 20. An alternator as recited in claim 19
2 wherein said set of windings is coupled to a common node.

1 21. An alternator as recited in claim 19
2 wherein said set of windings is coupled schematically in a
3 polygon.